AGRICULTURE SCIENCE AND TECHNOLOGY
Curriculum Content Framework

Prepared By
Lonni Davis, Crossett High School
Glynn Gibson, Drew Central High School
James Hager, Pocahontas Junior High School
Jennifer Johnson, Camden-Fairview High School
James Pennington, Hope High School
Bill Pruitt, Beebe Junior High School
Daniel Smith, Palestine-Wheatley High School
Lewis Villines, Flippin High School
Jim Wilcox, Waldron High School

Facilitated By
Karen Chisholm, Program Manager
Office of Assessment and Curriculum
Arkansas Department of Workforce Education

Edited By
Angela Collins, Program Advisor
Office of Agriculture Science and Technology
Arkansas Department of Workforce Education

Disseminated By
Career and Technical Education
Office of Assessment and Curriculum
Arkansas Department of Workforce Education

Development/Revision Began: 10/2002 Placed on the Web: 08/2004

Curriculum Content Framework

AGRICULTURAL SCIENCE AND TECHNOLOGY

Grade Levels: 9, 10, 11, 12 **Prerequisites: None**
Course Code: 491012

Course Description: A foundation course for all agriculture programs of study. Topics covered include general agriculture, FFA, leadership, record keeping, Supervised Agricultural Experiences, animal science, plant science, soil science, and agricultural mechanics.

Table of Contents

Unit 1: Introduction to Agriculture
10 Hours

Terminology: Agribusiness, Agriculture, Agriculture mechanics, Agriscience, Animal science, Aquaculture, Commodity, Horticulture, Natural resource

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		**ACADEMIC AND WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
1.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
1.2 Explain the importance of agriculture in our everyday lives	1.2.1 Create a collage showing how agriculture is a part of your life	Foundation Thinking	Speaking Creative Thinking	Asks questions to clarify information [1.5.3] Asks questions to obtain information [1.5.4] Applies personal style to a drawing [4.1.11]
1.3 Discuss changes that have come about in agriculture due to technology	1.3.1 Compare farming techniques in use today with those 100 years ago	Foundation Thinking	Reading Reasoning	Determines what information is needed [1.3.10] Sees relationship between two or more ideas, objects, or situations [4.5.5]
1.4 Determine the impact of agriculture on the United States' economy	1.4.1 Conduct a scavenger hunt for prices of common commodities, then compare with foreign markets	Foundation Personal Management	Arithmetic/ Mathematics Responsibility	Calculates percentages, ratios, proportions, decimals, and common fractions [1.1.10] Sets high standards for self in completion of a task [3.4.9]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
1.5 Identify careers related to agriculture	1.5.1 Research a career in agriculture to determine educational requirements, working conditions, and salary	Foundation	Reading	Applies information to job performance [1.3.4] Uses standard occupational resource materials [1.3.22]
		Personal Management	Career Awareness, Development, and Mobility	Develops skills to locate, evaluate, and interpret career information [3.1.4] Explores career opportunities [3.1.6]

Unit 2: The National FFA Organization
15 Hours

Terminology: CDE, FFA, Leadership

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		**ACADEMIC AND WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
2.2 Explain the relationship of the National FFA organization to agricultural education	2.2.1 Reinforce by analyzing the FFA mission statement	Foundation Thinking	Reading Reasoning	Draws conclusions from what is read [1.3.12] Sees relationship between two or more ideas, objects, or situations [4.5.5]
2.3 State the official colors of the FFA	2.3.1 Explain the significance of national blue and corn gold	Foundation Personal Management	Listening Organizational Effectiveness	Listens for content [1.2.3] Adapts to the organization's goals, values, culture, and traditional modes of operation [3.3.1]
2.4 Explain what the parts of the official FFA emblem symbolize	2.4.1 Label the parts of the FFA emblem	Foundation Personal Management	Reading Organizational Effectiveness	Locates pertinent information in documents such as manuals, graphs, and schedules to perform tasks [1.3.18] Adapts to the organization's goals, values, culture, and traditional modes of operation [3.3.1]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
2.5 Outline the history of the FFA	2.5.1 Refer to the FFA chronological timeline in the National FFA Manual	Foundation	Writing	Communicates thoughts, ideas, or facts in written form in a clear, concise manner [1.6.6]
		Thinking	Knowing How to Learn	Develops personal learning strategies—note taking, clustering related items, flash cards, etc. [4.3.2]
2.6 Discuss the proper use of the FFA jacket	2.6.1 Refer to the National FFA Manual	Foundation	Reading	Comprehends written information for main ideas [1.3.7]
		Personal Management	Self-Esteem	Creates self-confidence and positive self-image through proper grooming [3.5.3]
2.7 Explain the significance of the FFA Creed	2.7.1 Recite the FFA Creed from memory	Foundation	Speaking	Speaks in a clear, concise manner [1.5.12]
		Personal Management	Integrity/Honesty/ Work Ethic	Describes/Explains significance of integrity, honesty, and work ethics [3.2.4]
2.8 Identify Career Development Events in which FFA members may participate	2.8.1 List all CDE areas offered at the state and national levels	Foundation	Reading	Locates pertinent information in documents such as manuals, graphs, and schedules to perform tasks [1.3.18]
		Personal Management	Career Awareness, Development, and Mobility	Sets well-defined and realistic personal/career goals (short-term and long-term) [3.1.11]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
2.9 Discuss the duties of FFA chapter officers	2.9.1 Refer to the duties outlined in the National FFA Manual	Foundation	Speaking	Interprets nonverbal cues such as eye contact, posture, and gestures for meaning [1.5.6]
		Personal Management	Responsibility	Is punctual to class, school meetings, and work [3.4.6]
2.10 List the degrees an FFA member may earn	2.10.1 Discuss and describe the criteria for each degree that members may earn	Foundation	Writing	Writes/Prints legibly [1.6.24]
		Personal Management	Career Awareness, Development, and Mobility	Establishes and implements a plan of action [3.1.5]

Unit 3: Supervised Agricultural Experience Programs
9 Hours

Terminology: Entrepreneurship, Placement, Production, Record book, SAE

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		**ACADEMIC AND WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
3.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
3.2 Explain the difference between the production, entrepreneurship, and placement SAEs	3.2.1 List examples of projects students may have as SAEs	Foundation	Speaking	Asks questions to clarify information [1.5.3] Asks questions to obtain information [1.5.4]
		Thinking	Problem Solving	Draws conclusions from observations, evaluates conditions, and gives possible solutions [4.4.5]
3.3 Explain the purpose of the SAE record book	3.3.1 Complete the preliminary pages of the record book	Foundation	Arithmetic/ Mathematics	Enters figures/calculations from one form or chart to another [1.1.21]
		Thinking	Seeing Things in the Mind's Eye	Imagines the flow of work activities from narrative descriptions [4.6.1]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
3.4 Explain the relationship between SAEs and the FFA Proficiency Award program	3.4.1 Analyze a Proficiency Award application to determine the information it should contain	Foundation	Arithmetic/ Mathematics	Applies addition, subtraction, multiplication, and division to real-world situations [1.1.1]
		Personal Management	Career Awareness, Development, and Mobility	Monitors progress toward goal attainment [3.1.10]

Unit 4: Animal Science
17 Hours

Terminology: Artificial insemination, Breed, Gestation, Lactation, Nonruminant, Polled, Ruminant, Vaccination

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		**ACADEMIC AND WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
4.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
4.2 Discuss digestive systems of common classes of livestock	4.2.1 Compare the digestive tracts of ruminants, nonruminants, and poultry	Foundation	Reading	Draws conclusions from what is read [1.3.12]
		Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]
4.3 List the major classes of nutrients	4.3.1 Discuss their role in livestock health	Foundation	Writing	Uses technical words and symbols [1.6.20]
		Thinking	Problem Solving	Draws conclusions from what is read and gives possible solutions [4.4.4]
4.4 Discuss gender terminology of beef and dairy cattle, swine, sheep, goats, horses, and poultry		Foundation	Reading	Draws conclusions from what is read [1.3.12]
		Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]
4.5 Identify retail cuts of beef, pork, and poultry		Foundation	Speaking	Organizes ideas and communicates oral messages to listeners [1.5.7]
		Thinking	Creative Thinking	Makes connections between seemingly unrelated ideas [4.1.6]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
4.6 Describe gestation periods and characteristics of cattle, swine, sheep, goats, and horses		Foundation Thinking	Reading Reasoning	Draws conclusions from what is read [1.3.12] Sees relationship between two or more ideas, objects, or situations [4.5.5]
4.7 Identify common breeds of beef and dairy cattle, swine, sheep, goats, horses, and poultry		Foundation Thinking	Reading Reasoning	Draws conclusions from what is read [1.3.12] Sees relationship between two or more ideas, objects, or situations [4.5.5]
4.8 Discuss management practices of beef and dairy cattle, swine, sheep, goats, horses, and poultry		Foundation Thinking	Reading Reasoning	Draws conclusions from what is read [1.3.12] Sees relationship between two or more ideas, objects, or situations [4.5.5]
4.9 List and describe common animal diseases	4.9.1 Invite a veterinarian to speak to your class about diseases in the animal community 4.9.2 Evaluate a sick animal and diagnose the disease	Foundation Thinking	Reading Reasoning	Draws conclusions from what is read [1.3.12] Sees relationship between two or more ideas, objects, or situations [4.5.5]

Unit 5: Plant Science
10 Hours

Terminology: Annual, Biennial, Dicot, Fertilizer, Monocot, Perennial, Photosynthesis, Respiration, Transpiration

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		**ACADEMIC AND WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
5.2 Identify the four major parts of a plant and their functions	5.2.1 Label the parts of the root, stem, leaf, and flower	Foundation Thinking	Science Knowing How to Learn	Describes/Explains scientific principles related to plant functions [1.4.14] Locates appropriate learning resources to acquire or improve knowledge and skills [4.3.3]
5.3 Discuss the basic concepts of photosynthesis and respiration	5.3.1 Describe the chemical equations and how they sustain the plant	Foundation Thinking	Science Seeing Things in the Mind's Eye	Describes/Explains scientific principles related to photosynthesis [1.4.14] Visualizes a system's operation from schematics [4.6.3]
5.4 Compare monocot and dicot plants	5.4.1 Conduct a germination experiment to compare the seed leaves of monocots and dicots	Foundation Thinking	Science Knowing How to Learn	Acquires and processes scientific data [1.4.1] Uses available resources to acquire new skills or improve skills [4.3.4]
5.5 Identify requirements for plant growth	5.5.1 Discuss the 16 essential nutrients	Foundation Interpersonal	Reading Teamwork	Follows written directions [1.3.13] Works effectively with others to reach a common goal [2.6.6]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
5.6 Explain the role of fertilizers and their importance	5.6.1 Conduct a soil test and analyze results	Foundation	Science	Solves practical problems using scientific methods and techniques [1.4.22]

Unit 6: Forestry and Natural Resources
8 Hours

Terminology: Conservation, Forestry, Nonrenewable resource, Renewable resource, Soil, Water, Wildlife

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		**ACADEMIC AND WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
6.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
6.2 Explain the importance of soil and water conservation	6.2.1 Discuss the role of conservation acts and the agencies that regulate them	Foundation Personal Management	Science Integrity/Honesty/ Work Ethic	Analyzes environmental issues (ecology, pollution, waste management) [1.4.2] Chooses ethical course of action [3.2.1]
6.3 Discuss the importance of forestry	6.3.1 Identify major species of trees in the local area 6.3.2 List major forestry products	Foundation Thinking	Speaking Knowing How to Learn	Organizes ideas and communicates oral messages to listeners [1.5.7] Uses available resources to acquire new skills or improve skills [4.3.4]
6.4 List the major species of wildlife in Arkansas	6.4.1 Identify important species of wildlife in the local area	Foundation Thinking	Writing Reasoning	Writes/Prints legibly [1.6.24] Sees relationship between two or more ideas, objects, or situations [4.5.5]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
6.5 Discuss recreational use of natural resources	6.5.1 Highlight Arkansas' own natural resources and their role in the economy	Foundation	Listening	Listens for content [1.2.3] Listens for long-term contexts [1.2.7]
		Personal Management	Responsibility	Exhibits enthusiasm in approaching and completing tasks [3.4.3]

Unit 7: Agricultural Leadership
15 Hours

Terminology: Extemporaneous speech, Minutes, Motion, Opening/closing ceremony, Parliamentary procedure, Prepared speech, Vote

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		**ACADEMIC AND WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
7.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
7.2 List the three major parts of a speech	7.2.1 Prepare a three- to five-minute speech 7.2.2 Present the speech to the class	Foundation	Speaking Writing	Uses verbal language and other cues such as body language appropriate in style, tone, and level of complexity to the audience and the occasion [1.5.14] Produces neat, legible document from typewriter or computer [1.6.15]
7.3 Explain the purpose of parliamentary procedure	7.3.1 Refer to official FFA manual, and discuss the order of business 7.3.2 Provide a class demonstration	Foundation Personal Management	Speaking Organizational Effectiveness	Applies/Uses technical terms as appropriate to audience [1.5.2] Comprehends the organization's modes of operation [3.3.5]
7.4 Explain the purpose of opening/closing ceremony	7.4.1 Refer to the official FFA manual 7.4.2 Provide a class demonstration	Foundation	Speaking	Organizes ideas and communicates oral messages to listeners [1.5.7] Speaks effectively using appropriate eye contact, gestures, and posture [1.5.11]

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
7.5 Discuss common leadership traits	7.5.1 Provide examples of famous leaders	Interpersonal	Leadership	Comprehends ideas and concepts related to leadership [2.4.2]

Unit 8: Agricultural Issues
6 Hours

Terminology: Animal rights, Animal welfare, Biotechnology, EPA, FEMA, Food safety, USDA

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		**ACADEMIC AND WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
8.1 Define terms		Foundation	Reading	Applies/Understands technical words that pertain to subject [1.3.6]
8.2 Identify past issues in agriculture	8.2.1 Discuss the effect of these on society	Foundation Interpersonal	Reading Teamwork	Distinguishes between fact and opinion [1.3.11] Contributes to group with ideas, suggestions, and effort [2.6.2]
8.3 Discuss current issues in agriculture	8.3.1 Discuss the pros and cons of these issues	Foundation Interpersonal	Reading Negotiation	Identifies inaccurate information/entries on written documents [1.3.15] Works to resolve conflict between two or more individuals [2.5.3]

Unit 9: Electricity
5 Hours

Terminology: Amp, Circuit, Conduit, Ground, Romex, Switch, Volt, Watt

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
9.1 Determine correct safety procedures in the electricity area	9.1.1 Practice proper electrical safety	Thinking	Reasoning	Applies rules and principles to a new situation [4.5.1]
9.2 Define terms associated with electricity		Foundation	Writing	Communicates thoughts, ideas, or facts in written form and clear concise manner[1.6.6]
9.3 Identify basic electrical symbols	9.3.1 Recognize the symbols for single pole switch, three-way switch, four-way switch, convenience outlet, 240-volt outlet, and lighting outlet	Thinking	Knowing How to Learn	Processes new information as related to workplace {4.3.5]
9.4 Identify basic electrical tools and devices	9.4.1 Match tools and devices with proper names	Thinking	Decision Making	Evaluates information/data to make the best decision [4.2.4]
9.5 Define and identify the different wire colors of black, red, white, and green	9.5.1 Match wire colors with use	Thinking	Decision Making	Comprehends ideas and concepts related to NEC color coding {4.2.2]
9.6 Demonstrate basic electrical skills	9.6.1 Attach a wire nut 9.6.2 Bend a hook end in wire 9.6.3 Make a pigtail splice	Thinking	Seeing Things in the Mind's Eye	Organizes and processes images—symbols, pictures, graphs, objects, etc. [4.6.2]

Unit 10: Arc Welding
5 Hours

Terminology: Alternating current, Amperage, Bead, Direct current, Electrode, Flux, Polarity, Shielded metal arc welding

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		**ACADEMIC AND WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
10.1 Discuss proper arc welding safety procedures	10.1.1 Demonstrate safety procedures while performing arc welding skills	Thinking	Decision Making	Accepts responsibility for decision about using proper safety equipment [4.2.1]
10.2 Identify arc welding tools and equipment	10.2.1 Associate tools with their proper use	Thinking	Reasoning	Applies rules and principles to a new situation [4.5.1]
10.3 Set up arc welding equipment	10.3.1 Adjust welder 10.3.2 Select supplies and materials	Personal Management	Organizational Effectiveness	Applies knowledge to implement work-related system or practice [3.3.4]
10.4 Strike and hold an arc	10.4.1 Establish and hold an arc	Thinking	Knowing How to Learn	Uses available resources to apply new skills [4.3.6]
10.5 Describe procedures to run a bead	10.5.1 Run a bead in the flat position	Foundation	Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
10.6 Define terms associated with arc welding		Thinking	Knowing How to Learn	Processes new information related to workplace [4.3.5]

Unit 11: Metal Technology
5 Hours

Terminology: Alloy, Anneal, Ferrous, Gauge, Nonferrous, Solder, Tempering

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
11.1 Determine correct safety practices in metal technology area	11.1.1 Practice proper safety precautions	Thinking	Decision Making	Accepts responsibility for a decision [4.2.1]
11.2 Identify metal working hand tools	11.2.1 Match tools to their correct name	Thinking	Reasoning	Applies rules and principles to a new situation {4.5.1]
11.3 Identify different metal shapes	11.3.1 Match metal shapes with names	Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]
11.4 Identify marking and measuring devices	11.4.1 Lay out a project design using marking and measuring tools	Thinking	Knowing How to Learn	Locates appropriate learning resources to acquire or improve knowledge and skills [4.3.3]
11.5 Describe methods of using metal fasteners: solder, rivets, bolts, screws	11.5.1 Attach metals using various methods	Foundation	Science	Applies scientific principles related to fastening metal objects. [1.4.5]
11.6 Define terms associated with metal technology		Thinking	Knowing How to Learn	Processes new information as related to workplace [4.3.5]

Unit 12: Oxyacetylene Welding
5 Hours

Terminology: Acetylene, Brazing, Carburizing flame, Fusion weld, Neutral flame, Oxidizing flame, Oxygen, Working pressure

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		**ACADEMIC AND WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
12.1 Describe proper gas welding safety practices	12.1.1 Demonstrate proper safety practices while using gas welding equipment	Thinking	Decision Making	Accepts responsibility for decision [4.2.1]
12.2 Identify the parts of an oxyacetylene torch outfit	12.2.1 Set up and assemble an oxyacetylene welding outfit	Thinking	Reasoning	Applies rules and principles to a new situation [4.5.1]
12.3 Discuss proper procedures to turn on and adjust an oxyacetylene welding outfit	12.3.1 Light and adjust the carburizing, neutral, and oxidizing flames	Thinking	Reasoning	Applies rules and principles to a new situation [4.5.1]
12.4 Describe methods to construct fusion welds with and without filler rod	12.4.1 Weld fusion bead with and without filler rod	Foundation	Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
12.5 Describe methods of cutting with an oxyacetylene torch	12.5.1 Perform a cutting and piercing exercise	Foundation	Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
12.6 Define terms associated with oxyacetylene welding		Thinking	Knowing How to Learn	Processes new information as related to workplace [4.3.5]

Unit 13: Power Tools
5 Hours

Terminology: Circular saw, Crosscut, Ground fault circuit interruptor, Kerf, Kickback, Rip, RPM, Twist drill

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		**ACADEMIC AND WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
13.1 Determine correct safety procedures for using power tools	13.1.1 Practice power tool safety	Thinking	Decision Making	Accepts responsibility for a decision [4.2.1]
13.2 Identify different classes of power tools	13.2.1 Match power tool to correct class: stationary or portable	Thinking	Reasoning	Applies rules and principles to a new situation [4.5.1]
13.3 Identify parts of power tools	13.3.1 Identify parts of a portable circular saw 13.3.2 Identify parts of a saber saw 13.3.3 Identify parts of a hand drill	Thinking	Reasoning	Sees relationship between two or more ideas, objects, or situations [4.5.5]
13.4 Define terms associated with power tools		Thinking	Knowing How to Learn	Processes new information as related to workplace [4.3.5]

Unit 14: Small Engines
5 Hours

Terminology: Carburetor, Compression stroke, Exhaust stroke, Horsepower, Ignition, Intake stroke, Power stroke

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		**ACADEMIC AND WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
14.1 Determine the correct safety procedures in small engine shops	14.1.1 Practice proper safety procedures in a small engine shop	Thinking	Decision Making	Accepts responsibility for decision [4.2.1]
14.2 Identify tools used in working with small engines	14.2.1 Match tools with proper names	Thinking	Reasoning	Applies rules and principles to a new situation [4.5.1]
14.3 Describe the strokes and functions of small gasoline engines	14.3.1 List strokes and analyze functions of two- and four-cycle engines	Foundation	Speaking	Communicates a thought, idea, or fact in spoken form [1.5.5]
14.4 Define basic engine terminology		Thinking	Knowing How to Learn	Processes new information as related to workplace [4.3.5]

Unit 15: Tool Maintenance
5 Hours

Terminology: Blade balance, Concave bevel, Convex bevel, Double inclined plane, High-speed drill, Hollow ground, Honing, Single inclined plane

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		**ACADEMIC AND WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
15.1 Determine proper safety methods used in maintaining tools	15.1.1 Practice tool safety and maintenance procedures	Thinking	Decision Making	Accepts responsibility for decisions [4.2.1]
15.2 Protect tools from environmental hazards and misuse	15.2.1 Identify environmental hazards and tool misuse	Thinking	Reasoning	Applies rules and principles to a new situation [4.5.1]
15.3 Describe basic tool service techniques	15.3.1 Sharpen cold chisel 15.3.2 Sharpen lawn mower blade 15.3.3 Sharpen wood chisel	Thinking	Knowing How to Learn	Applies new knowledge and skills to sharpen tools [4.3.1]
15.4 Define terms associated with tool maintenance		Thinking	Knowing How to Learn	Processes new information as related to workplace [4.3.5]

Unit 16: Plumbing
5 Hours

Terminology: Fitting, ID, OD, Pipe, Reaming, Threading

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		**ACADEMIC AND WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
16.1 Identify basic plumbing tools	16.1.1 Match tools with proper names	Thinking	Reasoning	Applies rules and principles to a new situation [4.5.1]
16.2 Identify different kinds of pipe and fittings with their uses	16.2.1 Associate different kinds of pipe and fittings with proper uses	Thinking	Reasoning	Comprehends ideas and concepts related to pipe fitting [4.5.2]
16.3 Define plumbing terms	16.3.1 Match terms with definitions	Thinking	Knowing How to Learn	Processes new information as related to workplace [4.3.5]\

Unit 17: Hand Tool Woodworking
5 Hours

Terminology: Board foot, Common nail, Crosscut hand saw, Dado, Finishing nail, Rabbet, Rip hand saw, Saw kerf

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		**ACADEMIC AND WORKPLACE SKILLS** What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
17.1 Outline hand tool woodworking safety practices	17.1.1 Demonstrate safety practices for hand tool woodworking	Thinking	Decision Making	Accepts responsibility for decision [4.2.1]
17.2 Identify hand woodworking tools	17.2.1 Match woodworking tools with their proper names	Thinking	Knowing How to Learn	Processes new information as related to workplace [4.3.5]
17.3 Demonstrate using common measuring devices	17.3.1 Use a tape measure 17.3.2 Use a combination square 17.3.3 Use a framing square	Thinking	Reasoning	Determines which conclusions are correct when given a set of facts and a set of conclusions [4.5.3]
17.4 Demonstrate using woodworking hand tools	17.4.1 Use a hammer 17.4.2 Use a hand saw 17.4.3 Use a chisel 17.4.4 Use a plane	Thinking	Seeing Things in the Mind's Eye	Visualizes a finished product [4.6.4]
17.5 Define hand tool woodworking terms		Thinking	Knowing How to Learn	Processes new information as related to workplace [4.3.5]

Unit 18: Ag Graphics
5 Hours

Terminology: Borderline, Drawing, Extension line, Hidden line, Object line, Scale, Sketch

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
18.1 Recite the names and functions of drawing equipment	18.1.1 Identify drawing equipment	Thinking	Decision Making	Comprehends ideas and concepts related to drawing [4.2.2]
18.2 Define drawing symbols	18.2.1 Match drawing symbols with their definitions	Thinking	Knowing How to Learn	Applies new knowledge and skills to drawing [4.3.1]
18.3 Interpret drawings of simple objects	18.3.1 Interpret the drawing of a simple object	Thinking	Creative Thinking	Creates new design by applying specified criteria [4.1.3]
18.4 Describe the making of an orthographic drawing	18.4.1 Make an orthographic drawing of a simple object	Thinking	Seeing Things in the Mind's Eye	Visualizes a finished product [4.6.4]
18.5 Define terms associated with ag graphics	18.5.1 Define terms associated with ag graphics	Thinking	Knowing How to Learn	Applies new knowledge and skills to drawings [4.3.1]

Unit 19: Surveying
5 Hours

Terminology: Backsite reading, Benchmark, Foresite reading, Height of instrument, Level, Surveying rod

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
19.1 Discuss safety practices associated with surveying	19.1.1 Follow safety practices involved with surveying	Thinking	Decision Making	Accepts responsibility for decisions [4.2.1]
19.2 Identify surveying equipment	19.2.1 Identify basic surveying equipment	Thinking	Knowing How to Learn	Processes new information as related to workplace [4.3.5]
19.3 Describe the process of pacing	19.3.1 Demonstrate pacing to determine an approximate distance	Thinking	Reasoning	Uses logic to draw conclusions from available information [4.5.6]
19.4 Describe the proper procedure to make horizontal measurements	19.4.1 Determine the distance between two points, using the proper method	Thinking	Problem Solving	Revises plan of action indicated by findings [4.4.9]
19.5 Identify the process of setting up a level and taking a reading	19.5.1 Set up a level, and take a rod reading	Thinking	Knowing How to Learn	Uses available resources to acquire new skills or improve skills [4.3.4]
19.6 Define surveying terms		Thinking	Knowing How to Learn	Processes new information as related to workplace [4.3.5]

Unit 20: Concrete and Masonry
5 Hours

Terminology: Concrete, Form, Masonry, Mix, Mortar, Portland cement, Ratio

CAREER AND TECHNICAL SKILLS What the Student Should Be Able to Do		ACADEMIC AND WORKPLACE SKILLS What the Instruction Should Reinforce		
Knowledge	**Application**	**Skill Group**	**Skill**	**Description**
20.1 Define concrete and masonry tool terms	20.1.1 Match tools to their definitions	Thinking	Knowing How to Learn	Processes new information as related to workplace [4.3.5]
20.2 Select materials for concrete	20.2.1 Demonstrate ability by making a poured concrete object	Thinking	Problem Solving	Draws conclusions from observations, evaluates conditions, and gives possible solutions [4.4.4]
20.3 Estimate the amount of concrete needed for a job	20.3.1 Calculate the amount of concrete needed for a job in terms of cubic feet and cubic yards	Thinking	Problem Solving	Demonstrates logical reasoning in reaching a conclusion [4.4.2]

Glossary

Unit 1: Introduction to Agriculture

1. Agribusiness—businesses that are related to or dependent upon agriculture
2. Agriculture—the science of producing crops and raising livestock
3. Agriculture mechanics—design, construction, repair, and maintenance of machinery used throughout agriculture
4. Agriscience—using new technologies in the production of food, fiber, and shelter
5. Animal science—the science of animal growth, care, and management
6. Aquaculture—the science of producing aquatic plants and animals
7. Commodity—any agricultural product that one can buy, sell, or trade
8. Horticulture—the science of producing fruits, vegetables, and ornamental plants
9. Natural resource—a resource found in nature that supports life and produces fuel

Unit 2: The National FFA Organization

1. Career Development Event (CDE)—hands-on team competitions designed for FFA members to develop career-related skills
2. FFA—a national organization for students enrolled in agriculture education that promotes leadership, growth, and career success
3. Leadership—the ability to direct and guide others to accomplish a goal

Unit 3: Supervised Agricultural Experience Programs

1. Entrepreneurship—a student-owned business that serves as an SAE
2. Placement—an SAE in which students are employed in an agriculture-related field
3. Production—an SAE in which students learn to raise and manage crops and livestock
4. Record book—the proper place to record all SEA inventory, deposits, and expenditures
5. Supervised Agriculture Experience Program (SAE)—an opportunity for students designed to develop knowledge and skills in agriculture-related fields while in a supervised setting

Unit 4: Animal Science

1. Artificial insemination—reproduction by means other than natural mating
2. Breed—a group of animals having similar physical characteristics that are passed on to their offspring
3. Gestation—length of pregnancy
4. Lactation—a period of time when mammals are producing milk
5. Nonruminant—a simple-stomached animal
6. Polled—genetically without horns
7. Ruminant—an animal that has a stomach with more than one compartment
8. Vaccination—an agent administered to prevent disease

Unit 5: Plant Science

1. Annual—a plant that completes its life cycle in one year or less
2. Biennial—a plant that needs two years to complete its life cycle
3. Dicot—a plant with two seed leaves
4. Fertilizer—a material that supplies nutrients to plants
5. Monocot—a plant with one seed leaf
6. Perennial—a plant that needs more than two years to complete its life cycle
7. Photosynthesis—the food-making process of plants
8. Respiration—the process in which plants convert food to energy
9. Transpiration—the process by which a plant loses water vapor

Unit 6: Forestry and Natural Resources

1. Conservation—the control and preservation of natural resources for present and future use
2. Forestry—the production and management of trees for lumber and other related commodities
3. Nonrenewable resource—resources provided by nature that cannot replace themselves
4. Renewable resource—resources provided by nature that can replace themselves
5. Soil—the top layer of the earth's surface suitable for the growth of plants
6. Water—a colorless, odorless liquid essential for all forms of life
7. Wildlife—nondomesticated animals that thrive in natural environments

Unit 7: Agricultural Leadership

1. Extemporaneous speech—a type of speech in which the speaker prepares ideas but does not memorize exact words
2. Minutes—the official written record of a business meeting
3. Motion—a basic proposal that brings business before an assembly
4. Opening/closing ceremony—a traditional contest designed to emphasize the purpose of meetings and duties of officers
5. Parliamentary procedure—a method of conducting meetings in an orderly manner
6. Prepared speech—a type of speech in which the speaker prepares the speech completely beforehand
7. Vote—to give members the right to express approval of or opposition to a particular action

Unit 8: Agricultural Issues

1. Animal rights—a belief that animals have the same rights as humans and should not be eaten, used in research, or killed for fur
2. Animal welfare—a philosophy that believes in protecting the care and well-being of animals
3. Biotechnology—the use of cells or components of cells to enhance or transform them into new products
4. EPA—the Environmental Protection Agency
5. FEMA—the Federal Emergency Management Agency
6. Food safety—the monitoring of production and processing to ensure quality food items are available to consumers
7. USDA—the United States Department of Agriculture

Unit 9: Electricity

1. Amp—the measurement of electrical flow in a conductor
2. Circuit—an electrical source and wires connected to a light, heater, or motor
3. Conduit—metal tube with individually insulated wires
4. Ground—making an electrical connection between a piece of electrical equipment and the earth
5. Romex—sheathed cable containing individually insulated electrical wires
6. Switch—a device used to stop the flow of electrical current; used in controlling devices
7. Volt—the measurement of electrical pressure
8. Watt—the measurement of electrical power (W= V x A)

Unit 10: Arc Welding

1. Alternating current—current that reverses itself 60 times per second
2. Amperage—the measurement of electrical flow in a conductor
3. Bead—continuous and uniform line of filler metal
4. Direct current—current that flows in one direction continuously
5. Electrode—a metal welding rod coated with flux used in electric arc welding
6. Flux—material on an arc welding rod that cleans the metal, aids in proper cooling, and produces a gas shield for the weld
7. Polarity—the direction of electrical flow in the arc welding circuit (positive and negative)
8. Shielded metal arc welding—welding with electrical power as a source of heat and rods covered with flux that forms a gaseous shield around the molten metal until it solidifies

Unit 11: Metal Technology

1. Alloy—mixture of two or more metals
2. Anneal—to cool steel slowly so as to make it soft and malleable
3. Ferrous—metal that comes from iron ore
4. Gauge—metal thickness scale used to identify the thickness of metal under ¼”
5. Nonferrous—metals that do not contain iron
6. Solder—mixture of tin and lead used to fasten together sheet metal and electrical connections
7. Tempering—to heat a piece of tool steel followed by controlled cooling so as to control the degree of hardness

Unit 12: Oxyacetylene Welding

1. Acetylene—fuel gas used in oxyacetylene welding
2. Brazing—bonding with metals and alloys that melt above 840 degrees when capillary action occurs
3. Carburizing flame—a flame with an excess of acetylene in the mixture
4. Fusion weld—joining parts by melting them together
5. Neutral flam—a flame with a balance of oxygen and acetylene
6. Oxidizing flame—a flame with an excess of oxygen in the flame mixture
7. Oxygen—gas in the atmosphere necessary to support combustion
8. Working pressure—continuous regulated pressure supplied to the oxyacetylene torch assembly

Unit 13: Power Tools

1. Circular saw—power hand saw, lightweight, motor-driven, round bladed
2. Crosscut—to cut across the grain of wood
3. Ground fault circuit interruptor—a device that cuts off the electricity when small amounts of current are detected leaving the circuit
4. Kerf—opening in a board made by a saw
5. Kickback—the result of the binding of a saw in the material being worked, resulting in the uncontrolled throwing of the material or the saw
6. Rip—to cut along the grain of a board
7. RPM—revolutions per minute
8. Twist drill—common drill bit used for wood and metal

Unit 14: Small Engines

1. Carburetor—provides fuel and air to the engine in appropriate proportions and volume
2. Compression stroke—movement of an engine's piston to squeeze or compress the fuel/air mixture
3. Exhaust stroke—movement of the piston that expels burned gases from the cylinder
4. Horsepower—force needed to lift 550 pounds one foot in one second; rating system of engine power displacement
5. Ignition—a spark that ignites the fuel and air mixture
6. Intake stroke—engine process of taking fuel and air into the combustion chamber
7. Power stroke—engine process in which burning fuel expands rapidly but evenly to drive the piston downward

Unit 15: Tool Maintenance

1. Blade balance—a device used to balance a lawn mower blade to prevent excess vibration during operation
2. Concave bevel—a bevel that is hollowed or curved inward
3. Convex bevel—a bevel that is raised or curved outward
4. Double inclined plane—two bevels resulting in a point like an axe
5. High-speed drill—twist drill made and tempered specially to drill steel
6. Hollow ground—a single inclined plane that is concave ground
7. Honing—a method of sharpening using a bench stone or hand stone
8. Single inclined plane—a type of bevel with one edge; used on wood chisels and plane irons

Unit 16: Plumbing

1. Fitting—a part used to connect pieces of pipe or other pieces to pipe
2. ID—Inside diameter
3. OD—outside diameter
4. Pipe—a rigid tubelike material
5. Reaming—removing the burrs from the inside edge of cut pipe
6. Threading—the process of cutting threads on pipe

Unit 17: Hand Tool Woodworking

1. Board foot—a measurement of wood equaling 144 cubic inches (12” x 12” x 1”)
2. Common nail—a nail used for general construction
3. Crosscut hand saw—a saw filed with teeth shaped for cutting across the grain of wood
4. Dado—a square or rectangular groove in the face of a board
5. Finishing nail—a nail used for interior finishing work
6. Rabbet—a cut or groove at the end of a board made to receive another board and form a joint
7. Rip hand saw—a saw with teeth filed to a knifelike edge and used to cut with the grain
8. Saw kerf—the opening in lumber left by the saw blade

Unit 18: Ag Graphics

1. Borderline—a heavy solid black line drawn close to the outer edge of paper used to draw plans
2. Drawing—a picture or likeness made with a pencil, pen, chalk, crayon, or other instrument
3. Extension line—a solid line showing the exact area specified by the dimensions
4. Hidden line—a series of dashes that indicate an unseen edge
5. Object line—a solid line in a drawing that shows the visible edge of an object
6. Scale—an instrument with all the increments shortened according to proportion; numbers and graduations on measuring tools; a rigid steel rule or measuring device; the size of a plan compared with that of the object it represents
7. Sketch—a rough drawing of an idea, object, or procedure

Unit 19: Surveying

1. Backsite reading—a reading taken on a point of known elevation
2. Benchmark—a point of predetermined elevation
3. Foresite reading—a reading taken on a point of unknown elevation
4. Height of instrument—backsite plus elevation
5. Level—the surveying instrument
6. Surveying rod—a measuring device to determine vertical distances in making a land survey or contour map

Unit 20: Concrete and Masonry

1. Concrete—a mixture of stone aggregates, sand, Portland cement, and water that hardens as it dries
2. Form—a metal or wooden structure that contains concrete until it hardens
3. Masonry—anything made of brick, stone, tile, or concrete units held in place by masonry cement
4. Mix—ratio of materials in concrete or mortar
5. Mortar—mixture of Portland cement, finishing lime, and sand
6. Portland cement—a dry powder made by burning limestone and cla, followed by grinding and mixing
7. Ratio—proportion of one component to another by weight or volume